

ELECTRONIC PROGRAM GUIDE FOR PROCESSING CONTENT-RELATED
INFORMATION CONFIGURED USING A REFERENCE INFORMATION MODEL

Field of the Invention

5 The present invention relates generally to electronic program guides (EPGs) utilized to facilitate access to content, and more particularly to techniques for configuring EPGs to process content-related information in the form of extensible mark-up language (XML) documents.

10 Background of the Invention

EPGs are essential tools for management of the ever-increasing array of content available from information sources such as broadcast, satellite, cable and the Internet. As is well known, EPGs are generally associated with televisions, set-top boxes, personal video recorders (PVRs) or other similar devices, and can provide users of such devices with detailed information regarding available content, including titles, transmission times, actor lists, ratings, recommendations, etc.

25 A significant problem with existing EPGs is that there is no mechanism available to provide sufficient compatibility between the widely diverse applications that generate content. As a result, content generated by one application for a device having a particular type of EPG may not be configured in a manner suitable for processing by another device having a different type of EPG. Different devices are therefore generally required to have different EPGs, each specifically configured to operate with the particular content accessible via the corresponding device. This conventional approach requires excessive duplication of EPG

resources, and unduly limits user accessibility to content-related information.

It is also well known to utilize standard formats for delivery of content over computer networks such as the Internet. An example of one such standard format is the extensible mark-up language (XML), described in XML 1.0 (Second Edition), World Wide Web Consortium (W3C) Recommendation, October 2000, www.w3.org/TR/REC-xml, which is incorporated by reference herein. However, XML and other similar standard formats often fail to capture adequately the semantics used in content generation for different applications. For example, there is considerable heterogeneity in the semantics of EPG field names, reflecting a lack of agreement among system developers in this area. Therefore, sets of XML documents from different sources and corresponding EPG-equipped devices will generally not have the desired interoperability in the absence of a difficult-to-obtain specific prior agreement upon semantic definitions.

As is apparent from the foregoing, a need exists in the art for techniques that can allow different types of content from different sources to be configured in a standardized manner suitable for efficient processing by different EPGs, while avoiding the above-noted problems associated with the conventional approaches.

Summary of the Invention

The present invention meets the above-noted need by providing an electronic program guide (EPG) for processing of extensible mark-up language (XML) documents and other content-related

information configured in accordance with a reference information model (RIM). The RIM is designed such that XML documents or other content-related information can be generated therefrom in a consistent manner so as to be suitable for processing by a wide variety of different EPG applications.

In accordance with one aspect of the invention, at least a portion of the content-related information is configured for consistency with corresponding portions of the RIM, the portion of the content-related information so configured thereby being suitable for processing by different EPG applications.

The RIM preferably comprises multiple classes of information, and specifies properties of the classes utilizing attributes, relationships and states. For example, instances of the classes may be configured as objects in an object-oriented programming format, and one or more of the objects may contain structures represented as attributes. In an illustrative embodiment, the RIM includes multiple enumeration elements and multiple class elements, with a given one of the class elements being associated with at least a subset of the enumeration elements and at least a subset of the remaining class elements. By way of example, the given class element for content may be a program class element, and the remaining class elements may include class elements for movie, episode, personnel, cast, credits, station and designated market area.

In accordance with another aspect of the invention, the RIM may be generated utilizing an iterative process in which progressively more inclusive versions are generated by modifying previous versions to support additional data specifications. For

example, an initial version of the RIM may be generated using a first set of data specifications, and at least one subsequent version of the RIM may be generated from the initial version using at least a second set of data specifications. The subsequent
5 version of the RIM may be periodically updated in accordance with one or more sets of updated data specifications, as such updated specifications become available.

In accordance with yet another aspect of the invention, the content-related information may be transformed from a first format
10 not compliant with the RIM to a second format compliant with the RIM. The content-related information in the first format may comprise one or more documents for use with an EPG application of a type not based on the RIM, and may be subsequently converted into a desired RIM-compliant format. The transformation may utilize an XML style sheet generated at least in part utilizing the RIM and schema derived from the content-related information in the first
15 format.

Advantageously, the present invention through use of the RIM ensures that content from diverse information sources can be
20 processed in an efficient and effective manner by different EPGs, e.g., multiple EPGs associated with different processing devices of a residence, business or other user location. In addition, it allows XML documents developed for use with particular types of EPGs to be utilizable in an efficient manner on other EPGs. The
25 invention also eases semantic verification of conformance claims between EPG applications from different developers, and can improve the marketability of a given EPG-based processing device. Moreover, the use of the RIM in the manner described can ensure internal

consistency across the product lines of a given device manufacturer.

The invention thus facilitates the processing of EPG XML documents and other content-related information so as to deliver
5 consistent results in an efficient manner.

These and other features and advantages of the present invention will become more apparent from the accompanying drawings and the following detailed description.

10 **Brief Description of the Drawings**

FIG. 1 is a block diagram of an example information processing system in which the present invention is implemented.

FIG. 2 shows a portion of an example reference information model (RIM) in accordance with an illustrative embodiment of the invention.

FIG. 3 illustrates the manner in which different types of documents may be generated utilizing a RIM such as that shown in FIG. 2.

FIG. 4 is a flow diagram of a process for generating, adjusting and updating a RIM such as that shown in FIG. 2.

FIG. 5 is a flow diagram of a process for transforming a set of documents, utilizing a RIM such as that shown in FIG. 2.

FIG. 6 shows one possible embodiment of a device in which an electronic program guide (EPG) in accordance the invention is
25 implemented.

Detailed Description of the Invention

The present invention will be illustrated herein using an example information processing system and reference information model (RIM) for standardizing content-related information for processing by electronic program guides (EPGs). It should be understood, however, that the invention does not require the use of any particular system, RIM or EPG configuration, and is more generally suitable for use in any application involving an EPG in which it is desirable to provide improved processing of documents or other information in an extensible mark-up language (XML) format or other similar standardized format.

FIG. 1 shows an information processing system 100 that in this illustrative embodiment includes a residence 102 coupled to an external network 104. The residence 102 includes a number of processing devices 110 and corresponding EPGs 112. More particularly, the residence 102 includes a video game console 110-1, a television (TV) 110-2, a personal video recorder (PVR) 110-3, a set-top box 110-4, a music jukebox 110-5 and associated audio system 110-6, and a browser-equipped personal computer (PC) 110-7. Each of the processing devices 110-1, 110-2, . . . 110-7 has associated therewith a corresponding EPG 112-1, 112-2, . . . 112-7, respectively. The processing devices 110 are coupled to a home network 115 as shown.

Although described in conjunction with residence 102 in this embodiment, the invention can be implemented with any arrangement of one or more processing devices, e.g., mobile devices used away from a residence, or devices used within a business location or other enterprise. Moreover, although the EPGs 112 are shown in

FIG. 1 as being separate from their corresponding processing devices 110, the EPGs 112 are typically implemented within their corresponding devices.

The external network 104 supplies content from one or more information sources to the processing devices 110 of the residence 102. The network 104 may represent a combination of multiple conventional networks, such as telephone, broadcast, satellite, cable, Internet and other networks, each being coupled to the residence 102 via a given channel in a set of communication channels 115.

By way of example, a single information source in the form of a web server 120 is shown in the figure, although numerous other information sources could be used in place of or in conjunction with the web server 120. The web server 120 provides content services to one or more of the processing devices 110 of the residence 102. Associated with the web server 120 is an EPG 122. The web server 120 and its associated EPG 122 may be configured to deliver content to the processing devices 110 in the form of XML documents transmitted over an Internet portion of the network 104, using well-known techniques such as Internet protocol (IP) and transmission control protocol (TCP).

The EPGs 112 in this illustrative embodiment preferably include conventional XML parsers that permit extraction of content-related information from documents supplied by the web server 120 or other information source.

An XML parser may be viewed as a software library used to facilitate XML document manipulations. Examples of conventional XML parsers include the Xerces-J and Xerces-C parsers, and the XP

parser. Standard application programming interfaces (APIs) are used to provide predefined interfaces for one or more of these parsers. These APIs include DOM 1.0, described in Document Object Model (DOM) Level 1 Specification, Version 1.0, W3C Recommendation, 5 October 1998, www.w3.org/TR/1998/REC-DOM-Level-1-19981001, which is incorporated by reference herein, and SAX, described in SAX 2.0, "The Simple API for XML," www.megginson.com/SAX/sax.html, which is incorporated by reference herein. The above-noted Xerecs-J and Xerecs-C parsers implement both the DOM and SAX APIs, while the XP 10 parser implements only the SAX API.

The term "document" as used in this context is intended to include not only XML documents, but any other file or arrangement of information that may be transmitted from an information source of the system 100 for utilization by one or more of the processing devices 110 and/or an associated EPG 112.

The term "content-related information" as used herein is intended to be construed broadly so as to include content itself, as well as information characterizing content, and may be in the form of one or more documents.

It should be noted that the particular arrangement and configuration of elements shown in system 100 of FIG. 1 are by way of example only. In other embodiments, other types of servers, networks and processing devices may be used. Those skilled in the art will recognize that the EPG techniques of the present invention 25 do not require any particular arrangement or configuration of such system elements.

In accordance with one aspect of the present invention, one or more of the EPGs 112 associated with residence 102 are configured

to process XML documents generated using an EPG reference information model (RIM). Advantageously, the use of the RIM ensures that content from diverse information sources can be processed in an efficient and effective manner by different EPGs, e.g., the EPGs 112 of residence 102 in FIG. 1.

FIG. 2 shows an example of a RIM 200 in accordance with an illustrative embodiment of the invention. As will be described in detail below, the RIM 200 may be used to generate particular types of documents, e.g., XML documents, suitable for use with one or more of the processing devices 110 of the residence 102.

The RIM 200 includes interrelated elements arranged as shown, and is configured at least in part to model content-related information in a format similar to that described in Tribune Media Services, "Data specifications: TV schedules, U.S." Version 2.0, Tribune Media Services, January 29, 1999, and program listings from TV Data Technologies, www.tvdata.com, both of which are incorporated by reference herein.

Enumeration is used to describe constants within the modeled information. More particularly, the RIM 200 uses enumeration to describe constant elements 202-1, 202-2, . . . 202-15. The RIM 200 further includes class elements 204, 206, 208, 210, 212, 214, 216 and 218 for information classes denoted as program, movie, episode, personnel, cast, credits, station and designated market area, respectively. Additional details regarding each of the elements of the example RIM 200 can be found in the attached Appendix 1.

It can be seen from FIG. 2 that the program class 204 has directly or indirectly associated therewith the constant elements 202-1 through 202-15. Moreover, the program class 204 is directly

or indirectly associated with each of the other classes 206, 208, 210, 212, 214, 216 and 218 as shown.

The RIM 200 in the illustrative embodiment of FIG. 2 is an object-oriented model implemented using the well-known Unified Modeling Language (UML). UML is a preferred modeling language in that it provides a modeling notation having well-defined semantics that can be interpreted unambiguously, but other types of modeling languages may be used to generate a RIM in accordance with the invention. It should also be noted that enhancements to the modeling approach of the illustrative embodiment can be enhanced by the use of Object Constraint Language (OCL)-compliant UML tools, as described at www.omg.org.

The RIM 200 may also make use of conventional information model techniques such as those described in "Message Development Framework," HL7 Modeling and Methodology Committee, Version 3.2, April 1999.

The RIM 200 in the illustrative embodiment comprises a structured specification of the information requirements associated with one or more types of content. The RIM 200 expresses the classes of information required, and the properties of those classes including attributes, relationships, and states.

More particularly, the RIM 200 may be viewed as a structured specification of information requirements regarding exchange of content-related information. The RIM 200 provides a consistent view of the information being transmitted, as well as relationships to other information, in accordance with a specified semantic and syntactic consensus. This ensures that the content-related information exchanged is consistent and can be used by different

EPG applications. The term "EPG application" as used herein is intended to include any particular instance of an EPG as implemented in conjunction with a given processing device, e.g., a given one of the EPGs 112 or 122 as illustrated in FIG. 1, as well as portions or combinations of these and other EPGs.

Advantageously, the RIM 200 includes well-defined classes, which represent content-related information suitable for processing by an EPG, and specifies relationships among such classes. In a typical implementation, as is apparent from the foregoing example of FIG. 2, individual instances of these classes exist as objects, and contain structures represented as attributes.

FIG. 3 illustrates the manner in which different types of XML documents may be generated utilizing the RIM 200 of FIG. 2. In the illustrated process, the RIM 200 is utilized to generate XML documents for three different processing devices of the FIG. 1 system, namely, a PC, TV and PVR, shown as respective elements 110-7, 110-2 and 110-3 in FIG. 1. More particularly, operations 302A, 302B, and 302C utilize respective first, second and third portions of the RIM 200 shown as falling within corresponding dashed boxes. The operations 302A, 302B and 302C generate different XML schema 304A, 304B and 304C, respectively. The XML schema 304A, 304B and 304C, also denoted as XML Schema A, XML Schema B and XML Schema C in the figure, are then used to generate sets of XML documents 306A, 306B and 306C for the PC, TV and PVR, respectively. The schema 304A, 304B and 304C may represent, e.g., normative portions of EPG configurations for particular processing devices as determined by standards bodies for presentation of content on those devices.

Advantageously, this process provides the desired consistency between XML documents or other content-related information generated for different EPG applications associated with different processing devices. The invention in other embodiments can provide similar advantages for different EPG applications running on a single processing device.

The FIG. 3 process can be implemented at least in part using otherwise conventional XML document generation tools such as those commercially available from Rational, www.rational.com, XML Authority, www.extensibility.com, and others.

An example XML schema generated from a portion of the RIM 200 using the XML Authority 1.2 toolkit is as follows:

```
<?xml version = "1.0"?>
<!--Conforms to w3c http://www.w3.org/1999/XMLSchema-->
<schema xmlns = "http://www.w3.org/1999/XMLSchema">
  <element name = "EPG">
    <complexType content = "elementOnly">
      <sequence>
        <element ref = "Program"/>
      </sequence>
    </complexType>
  </element>
  <element name = "Program">
    <complexType content = "elementOnly">
      <sequence>
        <element ref = "AdvisoryDescription"/>
      </sequence>
      <attribute name = "uid" type = "string"/>
      <attribute name = "title" type = "string"/>
      <attribute name = "advisory_description" type =
"string"/>
      <attribute name = "air_date" type = "string"/>
      <attribute name = "air_time" type = "string"/>
      <attribute name = "duration" type = "string"/>
    </complexType>
```

```

    </element>
    <element name = "AdvisoryDescription">
      <complexType base = "NMTOKEN" content = "textOnly">
        <attribute name = "AdultSituations" type =
5  "string"/>
        <attribute name = "AdolescentesYAdultos" type =
"string"/>
        <attribute name = "Adultos" type = "string"/>
        <attribute name = "BriefNudity" type = "string"/>
10  <attribute name = "GraphicLanguage" type =
"string"/>
        <attribute name = "GraphicViolence" type =
"string"/>
        <attribute name = "Language" type = "string"/>
15  <attribute name = "MildViolence" type = "string"/>
        <attribute name = "Nudity" type = "string"/>
        <attribute name = "PublicoGeneral" type = "string"/>
        <attribute name = "Rape" type = "string"/>
        <attribute name = "StrongSexualContent" type =
20  "string"/>
        <attribute name = "Violence" type = "string"/>
      </complexType>
    </element>
  </schema>

```

As is apparent from this example, complete XML schema can be generated from the RIM 200 or from one or more suitable subsets thereof.

In accordance with another aspect of the invention, an iterative process for generating, adjusting and updating a RIM is provided.

FIG. 4 is a flow diagram of the iterative process. In this process a set of U.S. EPG data specifications 402 is utilized in generation step 404 to generate a U.S. EPG RIM 406. An example of such a U.S. EPG RIM is the RIM 200 previously described in conjunction with FIGS. 2 and 3. The U.S. EPG RIM 406 is then adjusted in an adjustment step 408 utilizing Europe EPG data

specifications 410. The result of the adjustment step 408 is a U.S. and European EPG RIM 412. The U.S. and European EPG RIM 412 is then itself adjusted in an adjustment step 414 utilizing global EPG data specifications 416. The result of the adjustment step 414 is
5 a global EPG RIM 418. This global EPG RIM 418 is subsequently updated in a refinement step 420 based on updated EPG data specifications 422.

In accordance with yet another aspect of the invention, a process is provided for transforming existing content-related
10 information for use with other EPGs.

FIG. 5 is a flow diagram of an illustrative embodiment of the above-noted process. This embodiment of the process utilizes the RIM 200 to transform a set of XML documents generated for use with an "external" EPG so as to be suitable for processing on another, different type of EPG. The FIG. 5 process includes steps 501, 502, 503, 504 and 505, also denoted generally as steps 1 through 5, respectively.

In step 501, working XML schema are generated or otherwise obtained from a set of external XML EPG documents 510. The result
20 of step 501 is one or more XML schema 512 for the external EPG.

An EPG RIM 514 is used in the FIG. 5 process. It is assumed without limitation that the EPG RIM 514 is associated with one or more particular EPG developers, e.g., Philips Electronics (hereinafter "Philips"). The documents 510 are referred to as
25 "external" in this embodiment in that they are assumed to be associated with another EPG developer external to the particular EPG developer(s).

In step 502, the XML schema 512 for the external EPG are related to the EPG RIM 514, e.g., by checking for syntax and semantics consistency. Then, in step 503, one or more Philips XML schema 516 are generated from an appropriate subset of the EPG RIM 514 as identified in step 502.

Step 504 utilizes the external XML schema 512 and the Philips XML schema 516 to generate XML patterns and XSLt transformation rules. The result of this step is an XML stylesheet 518 for transforming the external XML EPG documents 510 to new XML documents 520 that are compliant with the Philips EPG RIM 514. The XML stylesheet 518 may be applied to a conventional XSLt transformation engine as indicated in step 505, so as to transform the external XML EPG documents to the new Philips RIM-compliant XML EPG documents 520.

The FIG. 5 process thus maps the external EPG XML schema 512 to an appropriate subset of the EPG RIM 514 so as to create new, RIM-compliant schema 516. The RIM-compliant schema 516 are further processed to generate the XSL stylesheet 518 that is utilized to convert the external EPG XML documents 510 to the RIM-compliant documents 520.

The use of a RIM such as that described above for generation of EPG XML documents provides a number of significant advantages relative to conventional techniques. For example, it allows XML documents developed for use with particular types of EPGs to be utilizable in an efficient manner on other EPGs. In addition, this approach eases semantic verification of EPG XML conformance claims between applications from different sources. An appropriate level of conformance can also improve the marketability of a given EPG-

based processing device. Moreover, the use of the RIM in the manner described can ensure internal consistency across the product lines of a given device manufacturer.

The invention thus facilitates the processing of EPG XML documents and other content-related information so as to deliver consistent results in an efficient manner.

FIG. 6 shows an example of a processing device 600 in which an EPG configured using the techniques of the invention may be implemented.

The device 600 includes a processor 602 and a memory 604 which communicate over at least a portion of a set 605 of one or more system buses. Also utilizing at least a portion of the set 605 of system buses are a display 606 and one or more input/output (I/O) devices 608.

The device 600 may represent one or more of the devices 110 of the FIG. 1 processing system, or any other type of processing device that incorporates an EPG, and the elements of the device 600 may be conventional elements of such devices.

For example, the processor 602 may represent a microprocessor, central processing unit (CPU), digital signal processor (DSP), or application-specific integrated circuit (ASIC), as well as portions or combinations of these and other processing devices. The memory 604 is typically an electronic memory, but may comprise other types of storage devices, such as disk-based optical or magnetic memory.

The EPG techniques described herein may be implemented in whole or in part using software stored and executed using the respective memory and processor elements of the device 600. For example, one or more of the EPGs 112 of the FIG. 1 system may be

implemented at least in part using one or more software programs stored in memory 604 and executed by processor 602. The particular manner in which such software programs may be stored and executed in device elements such as memory 604 and processor 602 is well understood in the art and therefore not described in further detail herein.

It should be noted that the device 600 may include other elements not shown, or other types and arrangements of elements capable of providing the EPG processing functions described herein.

The FIG. 6 processing device may also be used to process content-related information for delivery to another processing device equipped with an EPG, e.g., using the techniques described in conjunction with FIGS. 3, 4 and 5.

The above-described embodiments of the invention are intended to be illustrative only. For example, the invention can be used in other types of information processing systems and devices using other arrangements of processing elements. In addition, as indicated above, the particular details of the RIM used in a given embodiment of the invention will vary depending upon the type of content to be delivered. These and numerous other alternative embodiments within the scope of the following claims will be apparent to those skilled in the art.

Implementation:

Attributes:

name : String
 num : unsigned int
 Rank : unsigned int

State machine: No
 Concurrency: Sequential
 Persistence: Transient

Class name:

StationTimeZone

Category: Logical View

Stereotype: enumeration

External Documents:

Export Control: Public

Cardinality: n

Hierarchy:

Superclasses: none

Associations:

<no rolename> : Station in association <unnamed>

Implementation:

Attributes:

GMT
 Newfoundland_D_S
 Newfoundland
 Atlantic_D_S
 Atlantic
 Eastern_D_S
 Eastern
 Central_D_S
 Central
 Mountain_D_S
 Mountain
 Pacific_D_S
 Pacific
 Hawaiian_D_S
 Hawaiian

5

10

15

```

<unnamed>      <no rolename> : DesignatedMarketArea in association
<unnamed>      <no rolename> : StationTimeZone in association
<unnamed>      <no rolename> : Program in association <unnamed>

```

35

40

20

fcc_channel_number : unsigned int
 FCC channel number of the
 broadcast station.

5

city : String
 City where station is located.

10

state : String
 State where station is located.

15

zip_code : unsigned int
 Postal zip code where station is
 located.

country : String
 Country where station is located.

time_zone : StationTimeZone
 Native time zone of the station.

State machine: No
 Concurrency: Sequential
 Persistence: Transient

Class name:
 LiveStatus

Category: Logical View
 Stereotype: enumeration
 External Documents:
 Export Control: Public
 Cardinality: n
 Hierarchy:
 Superclasses: none
 Associations:

35

40

<no rolename> : Program in association <unnamed>
 Implementation:
 Attributes:
 live

tape
delay

5 State machine: No
Concurrency: Sequential
Persistence: Transient

10 Class name:
ProgramLanguage

15 Category: Logical View
Stereotype: enumeration
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:
Superclasses: none
Associations:

<no rolename> : Program in association <unnamed>

Implementation:
Attributes:

English
French
German
Italian
Portuguese
Spanish

35 State machine: No
Concurrency: Sequential
Persistence: Transient

Class name:
ColorCode

40 Category: Logical View
Stereotype: enumeration
External Documents:
Export Control: Public

Cardinality: n
 Hierarchy:
 Superclasses: none
 Associations:

5

<no rolename> : Program in association <unnamed>

Implementation:
 Attributes:

10

BlackAndWhite
 Color
 ColorAndBlackAndWhite
 Colorized

15

State machine: No
 Concurrency: Sequential
 Persistence: Transient

Class name:
 PremiereFinal

Category: Logical View
 Stereotype: enumeration
 External Documents:
 Export Control: Public
 Cardinality: n
 Hierarchy:
 Superclasses: none
 Associations:

30

<no rolename> : Program in association <unnamed>

Implementation:
 Attributes:

35

Premiere
 Season Premiere
 Series Premiere
 Season Fianle
 Series Finale

40

State machine: No
 Concurrency: Sequential
 Persistence: Transient

Class name:
ShowType

5 Category: Logical View
 Stereotype: enumeration
 External Documents:
 Export Control: Public
 Cardinality: n
 10 Hierarchy:
 Superclasses: none
 Associations:
 <no rolename> : Program in association <unnamed>
 Implementation:
 Attributes:
 PaidProgramming
 Serial
 Series
 LimitedSeries
 ShortFilm
 MiniSeries
 Special

 State machine: No
 Concurrency: Sequential
 Persistence: Transient

30 Class name:
 Holiday

 Category: Logical View
 Stereotype: enumeration
 External Documents:
 35 Export Control: Public
 Cardinality: n
 Hierarchy:
 Superclasses: none
 Associations:
 40 <no rolename> : Program in association <unnamed>
 Implementation:
 Attributes:
 Christmas

Easter
 Thanksgiving
 FourthOfJuly
 YomKippur
 LaborDay
 NewYearsEve
 NewYearsDay
 Hanukkah
 ValentineDay
 Halloween
 SaintPatricksDay

State machine: No
 Concurrency: Sequential
 Persistence: Transient

Class name:
 NetworkSyndicationSource

Category: Logical View
 Stereotype: enumeration
 External Documents:
 Export Control: Public
 Cardinality: n
 Hierarchy:
 Superclasses: none

Associations:
 <no rolename> : Program in association <unnamed>

Implementation:
 Attributes:

abc
 cbs
 nbc
 pbs
 wb
 upn
 synd
 syn89
 hbc
 si
 src
 tqc

tva
cbc
ctv
uni
talk

5

State machine: No
Concurrency: Sequential
Persistence: Transient

10

Class name:
NetworkSyndicationType

15

Category: Logical View
Stereotype: enumeration
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:

Superclasses: none

Associations:

<no rolename> : Program in association <unnamed>

Implementation:

Attributes:

BroadcastNetwork
FirstRunSyndication
OffNetwork
CashBarter

30

State machine: No
Concurrency: Sequential
Persistence: Transient

35

Class name:
SourceType

Category: Logical View
Stereotype: enumeration
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:

40

Superclasses: none
Associations:

<no rolename> : Program in association <unnamed>

5

Implementation:
Attributes:

10

Block
Local
Network
Syndicated

15

State machine: No
Concurrency: Sequential
Persistence: Transient

Class name:
AdvisoryDescription

Category: Logical View
Stereotype: enumeration
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:
Superclasses: none
Associations:

30

<no rolename> : Program in association <unnamed>

35

Implementation:
Attributes:

40

AdultSituations
AdolescentesYAdultos
Adultos
BriefNudity
GraphicLanguage
GraphicViolence
Language

MildViolance
 Nudity
 PublicoGeneral
 Rape
 StrongSexualContent
 Violence

State machine: No
 Concurrency: Sequential
 Persistence: Transient

Class name:
 Program

Category: Logical View
 Documentation:
 Rating to indicate

External Documents:
 Export Control: Public
 Cardinality: n
 Hierarchy:
 Superclasses: none
 Associations:

<no rolename> : Station in association <unnamed>
 <no rolename> : LiveStatus in association <unnamed>
 <no rolename> : ProgramLanguage in association
 <unnamed>
 <no rolename> : ColorCode in association <unnamed>
 <no rolename> : PremiereFinal in association
 <unnamed>
 <no rolename> : ShowType in association <unnamed>
 <no rolename> : Holiday in association <unnamed>
 <no rolename> : NetworkSyndicationSource in
 association <unnamed>
 <no rolename> : NetworkSyndicationType in
 association <unnamed>
 <no rolename> : SourceType in association <unnamed>
 <no rolename> : AdvisoryDescription in association
 <unnamed>

<no rolename> : ProgramRating in association
<unnamed>

5

Implementation:
Attributes:

10

uid : String
 Uniqe Station ID Number.

15

title : String
 Official name by which a movie,
 show, episode or sports event is
 known.

20

alternate_title : String
 Alias name for program title;
 for example the title "Paid
 program" is stored here.

25

reduced_titles : String []
 They are reduced program titles.
 They are generally used for grid
 fitting. Each reduced title is
 shorter than the previous,
 depending on the length of the
 actual title and the duration of
 the program. For instance, a
 two-hour program with a long
 title may have 4 alternate
 titles, and another two-hour
 program with a very short title,
 may have no reduced title. The
 shortest alternate title is
 always edited to nine characters
 and the next shortest is edited
 to thirteen charcters.

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subtitle : String
 The subtitle field has the same
 specifications as the title
 field. In the case of sports,
 this field will contain the

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sports team name(s). For example,
 Title = Major League Baseball;
 Subtitle = Chicago Cubs vs. St.
 Louis Cardinals.

The subtitle is used when a
 program is commonly known by its
 umbrella title. For example,
 Masterpiece Theater will always
 have a subtitle designating the
 series currently being played.
 The main factor taken into
 consideration is whether the
 show has a recognition factor
 with the umbrella title or the
 umbrella title tells the reader
 more about the show. Anthology
 shows such as "Wonderful World
 of Disney" and "Masterpiece
 Theater" do use the subtitle
 field.

Team vs. Team, Playoff Sport,
 Sporting Event, Sports Related
 and Sports Anthology use the
 subtitle field. Team names,
 event names, the school from
 coach's shows, etc. go in the
 subtitle field. Pseudo-Sports
 never use the subtitle field.

reduced_subtitles : String []

They are reduced program
 subtitles. They are generally
 used for grid fitting. Each
 reduced subtitle is shorter than
 the previous, depending on the
 length of the actual title and
 the duration of the program.

description : String

String that describes the show,
 episode, or movie content and

includes embedded actors within this description.

The description fields are used to describe the action taking place in the program. We used all three fields in some cases, two fields in others and only one in some, generally broken down by program type.

Most programs must have a first description. The description length is generally determined by the duration of the program. A 30-minute program's description should not exceed 18 words. A 60-minute program's should not exceed 25 words. Longer programs can be written according to their content, for example, the Academy Awards is 3-hours and 30-minutes. The description can be longer than 25 words but should not be too long. Judgment is called for.

alternate_description : String
Alternate Description is used primarily by the Network and Movie editors. The network editors copy the first description and embed the actors' names into the description. The movie editors write a different movie description using the length guidelines of the first description.

reduced_descriptions : String []
Reduced descriptions are also known as the grid descriptions.

This field is regulated by length. Descriptions cannot exceed 45 characters per half-hour (including the title and subtitle fields). Style and language may be forsaken for fit but it should always create a readable, logical sentence. It is not necessary to fit the 45/90 parameters. This description is necessary for any show that falls between 6PM and midnight local time.

Reduced description is also used for 22/44 descriptions on the Talk Show program type. This includes any talk show that falls outside of the time parameters for 45/90. Examples: Good Morning America, Late Night Show, ... etc.

genre_description : String
Description of words or group of words that generally describe a show, episode, movie or sports event.

advisory_descriptions : AdvisoryDescription

Enumeration of the notation.

air_date : unsigned int

Date the program airs. The date will change from one date to the next at a start of the client-specified day cycle. For example, if the day cycle begins at 2:00 AM, the date will change at 2:00 AM. The day cycle may begin any time, but may not exceed 24 hours. The default cycle

starts at 12:00AM.

air_time unsigned int
Time of day the program airs;
hhmm military format.
Synonym: start_time.

duration : unsigned int
Calculated by subtracting the
current program's air time from
the subsequent program's air
time; hhmm format.

part_num : unsigned int
When a program is split into 2
or more viewings, this
designates which one it is.

num_of_parts : unsigned int
Designates when a program is
split into 2 or more parts for
viewing.

repeat : bool = false
designator for a program which
has aired previously.

network_syndication_source :
NetworkSyndicationSource
Network the program originates
from.

network_syndication_type :
NetworkSyndicationType
To specify broadcast network,
first run syndicated, cash
barter and off network
programming.

enhanced : bool
Designates enhances program
information.

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joined_in_progress : bool = false
 Joined in progress when a
 station begins airing a program
 at a time other than the
 official start time.

blackout : bool = false
 Designates if the program is
 subject to blackout restrictions.

hdtv : bool = true
 Designates if a show is
 broadcast in HDTV.

closed_captioning : bool = false
 Close Captioning: spoken content
 of program listed on-screen for
 the hearingimpaired.

stereo : bool = true
 Value that designates if a show,
 episode, movie or sports event
 is being broadcast in stereo.

three_d : bool
 Designates show in 3-D.

letterbox : bool
 Designates program is a
 letterbox version.

color_code : ColorCode
 Designates if a program was
 produced in color or back/white.

rating : ProgramRating

State machine: No
 Concurrency: Sequential
 Persistence: Transient

Class name:
TVRating

Category: Logical View

Stereotype: enumeration

External Documents:

Export Control: Public

Cardinality: n

Hierarchy:

Superclasses: none

Associations:

<no rolename> : ProgramRating in association
<unnamed>

Implementation:

Attributes:

TVY

TV7

TVG

TVPG

TV14

TVM

State machine: No

Concurrency: Sequential

Persistence: Transient

Class name:
ProgramRating

Category: Logical View

External Documents:

Export Control: Public

Cardinality: n

Hierarchy:

Superclasses: none

Associations:

<no rolename> : Program in association <unnamed>
 <no rolename> : TVRating in association <unnamed>

Implementation:

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Attributes:

tv_rating : TVRating
 TV Parental Guidelines in text
 form.

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dialog_rating : bool
 Rating to indicate strong dialog.

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fantasyviolence_rating : bool
 Rating to indicate fantasy
 violence.

09903185-071001
 2007-05-10

language_rating : bool
 Rating to indicate strong
 language.

sex_rating : bool
 Rating to indicate adult
 situations.

violence_rating : bool
 Rating to indicate strong
 violence.

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adult_language : bool
 adult_situations : bool
 brief_nudity : bool
 graphic_violence : bool
 mild_violence : bool
 nudity : bool
 strong_sexual_content : bool
 violence : bool

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State machine: No
 Concurrency: Sequential
 Persistence: Transient

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Class name:
RoleDescription

Category: Logical View
Stereotype: enumeration
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:

Superclasses: none
Associations:

<no rolename> : personnel in association <unnamed>

Implementation:
Attributes:

Actor
GuestStar
Director
ExecutiveProducer
Host
Producer
Writer

State machine: No
Concurrency: Sequential
Persistence: Transient

Class name:
Episode

Category: Logical View
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:
Superclasses: Program
Associations:

<no rolename> : personnel in association <unnamed>

Implementation:

Attributes:

syndicated_number : unsigned int
Distributor-designated number
corresponding to an episode
associated with a specific show.

alt_syndicated_number : unsigned int
Alternate numbering system for
syndicated programming. Can
differ from syndicated numbering
system.

episode_title : String
Descriptive title within the
episode. This field is used only
for series that designate a
specific name for each episode.
All wording must be used
including "The," "A" and "An".
All punctuation must be used
except the closing period.

State machine: No
Concurrency: Sequential
Persistence: Transient

Class name:
personnel

Category: Logical View
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:
Superclasses: none
Associations:

<no rolename> : RoleDescription in association
<unnamed>
<no rolename> : Episode in association <unnamed>

<no rolename> : movie in association <unnamed>

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Implementation:

Attributes:

first_name : String
First name.

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last_name : String
Last name.

role_description : RoleDescription
A role for an actor in a movie,
or a role describes the program
credits (director, executive
producer, or a host of a movie
or a show).

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0990135-01001
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State machine: No
Concurrency: Sequential
Persistence: Transient

Class name:
MPAARating

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Category: Logical View

Documentation:

Only unaltered movies as the MPAA (Motion Picture
Association of America) reviewed them can be given the
rating. Any alternation, such as changing the language
or editing the film or inserting commercials, will
void the MPAA rating

35

Stereotype: enumeration

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External Documents:

Export Control: Public

Cardinality: n

Hierarchy:

Superclasses: none
Associations:

<no rolename> : movie in association <unnamed>

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Implementation:
Attributes:

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AO
G

General

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PG

Parental Guidance recommended.

0990318-01001
FOOT 20 25

PG-13

Parental Guidance for children
under 13.

R

Restricted.

NC-17

No Children under 17.

NR
MA

Mature Audiences.

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X

X-rated.

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State machine: No
Concurrency: Sequential
Persistence: Transient

40

Class name:
movie

Category: Logical View

Documentation:

These ratings are researched and given tot the movie
by the movie editors.

External Documents:

Export Control: Public

Cardinality: n

Hierarchy:

Superclasses: Program

Associations:

<no rolename> : personnel in association <unnamed>

<no rolename> : MPAARating in association <unnamed>

<no rolename> : StarRating in association <unnamed>

Implementation:

Attributes:

mpaa_rating : MPAARating

Rating supplied by the Motion
Picture Association of America.

star_rating : StarRating

An arbitrary critical rating from
1/2 to 4 stars.

run_time : unsigned int

Actual duration which air on pay
cable services such as HBO,
CINMAX, ... etc.

country_of_origin : String

Used to distinguished between
domestic and foreign films.

made_for_tv : bool = true

Designator of films that was
made specifically for broadcast
on TV.

release_year : unsigned int
The year in which a movie was
released.

5 production_year : unsigned int
The year in which a movie was
produced.

10 State machine: No
Concurrency: Sequential
Persistence: Transient

15 Class name:
StarRating

Category: Logical View
Stereotype: enumeration
External Documents:
Export Control: Public
Cardinality: n
Hierarchy:
Superclasses: none
Associations:

<no rolename> : movie in association <unnamed>

Implementation:
Attributes:

One
OnePlus
Two
TwoPlus
Three
ThreePlus
Four

40 State machine: No
Concurrency: Sequential
Persistence: Transient

Association:

5

Derived: No
Direction: <non-directional>
Association Class: none

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Role:

Class: DesignatedMarketArea
Cardinality / Multiplicity: 1
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Role:

Class: Station
Cardinality / Multiplicity: 1..n
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

30

Association:

35

Derived: No
Direction: <non-directional>
Association Class: none

Role:

40

Class: Station
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No

Static: No
Friend: No
Access: Public
Containment: Unspecified

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Role:
Class: StationTimeZone
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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15

Association:

Derived: No
Direction: <non-directional>
Association Class: none

Role:
Class: Station
Cardinality / Multiplicity: 1..n
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Role:
Class: Program
Cardinality / Multiplicity: 1..n
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Association:

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Derived: No
Direction: <non-directional>
Association Class: none

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Role:

Class: LiveStatus
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Role:

Class: Program
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Association:

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Derived: No
Direction: <non-directional>
Association Class: none

Role:

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Class: Program
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No

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Static: No
Friend: No
Access: Public
Containment: Unspecified

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Association:

10 Derived: No
Direction: <non-directional>
Association Class: none

Role:

15 Class: Program
Cardinality / Multiplicity:
20 Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

Role:

25 Class: PremiereFinal
Cardinality / Multiplicity:
30 Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

35 Association:

40 Derived: No
Direction: <non-directional>
Association Class: none

Role:

Class: Program

Cardinality / Multiplicity:

Navigable: Yes

Aggregate: No

Static: No

Friend: No

Access: Public

Containment: Unspecified

Role:

Class: ShowType

Cardinality / Multiplicity:

Navigable: Yes

Aggregate: No

Static: No

Friend: No

Access: Public

Containment: Unspecified

Association:

Derived: No

Direction: <non-directional>

Association Class: none

Role:

Class: Program

Cardinality / Multiplicity:

Navigable: Yes

Aggregate: No

Static: No

Friend: No

Access: Public

Containment: Unspecified

Role:

Class: Holiday

Cardinality / Multiplicity:

Navigable: Yes

Aggregate: No

Static: No

Friend: No

Access: Public
Containment: Unspecified

5 Association:

Derived: No
Direction: <non-directional>
10 Association Class: none

Role:

Class: Program
Cardinality / Multiplicity:
15 Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
20 Containment: Unspecified

Role:

Class: NetworkSyndicationSource
Cardinality / Multiplicity:
25 Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
30 Containment: Unspecified

Association:

35 Derived: No
Direction: <non-directional>
Association Class: none

40 Role:

Class: Program
Cardinality / Multiplicity:
Navigable: Yes

Aggregate: No
 Static: No
 Friend: No
 Access: Public
 Containment: Unspecified

Role:

Class: NetworkSyndicationType
 Cardinality / Multiplicity:
 Navigable: Yes
 Aggregate: No
 Static: No
 Friend: No
 Access: Public
 Containment: Unspecified

Association:

Derived: No
 Direction: <non-directional>
 Association Class: none

Role:

Class: SourceType
 Cardinality / Multiplicity:
 Navigable: Yes
 Aggregate: No
 Static: No
 Friend: No
 Access: Public
 Containment: Unspecified

Role:

Class: Program
 Cardinality / Multiplicity:
 Navigable: Yes
 Aggregate: No
 Static: No
 Friend: No
 Access: Public
 Containment: Unspecified

Association:

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Derived: No
Direction: <non-directional>
Association Class: none

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Role:
Class: Program
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Role:
Class: AdvisoryDescription
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Association:

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Derived: No
Direction: <non-directional>
Association Class: none

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Role:

Class: ProgramRating
 Cardinality / Multiplicity:
 Navigable: Yes
 Aggregate: No
 Static: No
 Friend: No
 Access: Public
 Containment: Unspecified

Role:
 Class: Program
 Cardinality / Multiplicity:
 Navigable: Yes
 Aggregate: No
 Static: No
 Friend: No
 Access: Public
 Containment: Unspecified

Association:

Derived: No
 Direction: <non-directional>
 Association Class: none

Role:
 Class: TVRating
 Cardinality / Multiplicity:
 Navigable: Yes
 Aggregate: No
 Static: No
 Friend: No
 Access: Public
 Containment: Unspecified

Role:
 Class: ProgramRating
 Cardinality / Multiplicity:
 Navigable: Yes
 Aggregate: No
 Static: No

Friend: No
Access: Public
Containment: Unspecified

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Association:

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Derived: No
Direction: <non-directional>
Association Class: none

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Role:
Class: RoleDescription
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Role:
Class: personnel
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

Association:

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Derived: No
Direction: <non-directional>
Association Class: none

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Role:
Class: Episode
Cardinality / Multiplicity: 1

Navigable: Yes
Aggregate: Yes
Static: No
Friend: No
Access: Public
Containment: Unspecified

Role:

Class: personnel
Cardinality / Multiplicity: 1..n
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

Association:

Derived: No
Direction: <non-directional>
Association Class: none

Role:

Class: movie
Cardinality / Multiplicity: 1
Navigable: Yes
Aggregate: Yes
Static: No
Friend: No
Access: Public
Containment: Unspecified

Role:

Class: personnel
Cardinality / Multiplicity: 1..n
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public

Containment: Unspecified

Association:

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Derived: No
Direction: <non-directional>
Association Class: none

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Role:
Class: movie
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Role:
Class: MPAARating
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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Association:

Derived: No
Direction: <non-directional>
Association Class: none

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Role:
Class: movie
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No

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Friend: No
Access: Public
Containment: Unspecified

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Role:
Class: StarRating
Cardinality / Multiplicity:
Navigable: Yes
Aggregate: No
Static: No
Friend: No
Access: Public
Containment: Unspecified

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FOOTNOTES